

CLAIMS

I Claim:

1 1. A heating device within an integrated circuit, comprising:
2 a first conductive lead;
3 a second conductive lead;
4 a third conductive lead;
5 a first resistive region connected between the first conductive lead and the
6 third conductive lead; and,
7 a second resistive region connected between the second conductive lead
8 and the third conductive lead;
9 wherein a side formed by the first conductive lead and the first resistive
10 region is parallel to a side formed by the second conductive lead and the second
11 resistive region.

1 2. A heating device as in claim 1 wherein an insulator is placed between
2 the side formed by the first conductive lead and the first resistive region and the
3 side formed by the second conductive lead and the second resistive region.

1 3. A heating device as in claim 1 wherein an insulator is placed between
2 the first conductive lead and the second conductive lead, and wherein a third
3 resistive region is placed between the first resistive region and the second
4 resistive region, and wherein resistivity of the third resistive region is higher
5 than resistivity of the first resistive region and of the second resistive region.

1 4. A heating device as in claim 1:
2 wherein an insulator is placed between the side formed by the first
3 conductive lead and the first resistive region and the side formed by the second
4 conductive lead and the second resistive region, except for an area immediately
5 adjacent to the third conductive lead where a third resistive region separates the
6 first resistive region and the second resistive region; and,
7 wherein resistivity of the third resistive region is identical to resistivity
8 of the first resistive region and of the second resistive region.

1 5. A heating device as in claim 1:
2 wherein an insulator is placed between the first conductive lead and the
3 second conductive lead;
4 wherein a third resistive region is placed between the first resistive
5 region and the second resistive region, except for an area immediately adjacent
6 to the third conductive lead where a fourth resistive region separates the first
7 resistive region and the second resistive region;
8 wherein resistivity of the third resistive region is higher than resistivity
9 of the first resistive region and of the second resistive region; and,
10 wherein resistivity of the fourth resistive region is identical to resistivity
11 of the first resistive region and of the second resistive region.

1 6. A heating device as in claim 1:

2 wherein an insulator is placed between the side formed by the first
3 conductive lead and the first resistive region and the side formed by the second
4 conductive lead and the second resistive region, except for a plurality of areas
5 where third resistive regions separate the first resistive region and the second
6 resistive region; and,

7 wherein resistivity of the third resistive regions is identical to resistivity
8 of the first resistive region and of the second resistive region.

1 7. A heating device as in claim 1:

2 wherein an insulator is placed between the side formed by the first
3 conductive lead and the first resistive region and the side formed by the second
4 conductive lead and the second resistive region, except for a plurality of areas
5 where third resistive regions separate the first resistive region and the second
6 resistive region; and,

7 wherein resistivity of the third resistive regions is higher than resistivity
8 of the first resistive region and of the second resistive region.

1 8. A heating device as in claim 1 wherein the integrated circuit is
2 connected to a planar light circuit.

1 9. A heating device as in claim 1 wherein the integrated circuit is used
2 within an inkjet printhead.

1 10. A heating device comprising:
2 a first region formed from bottom layer of resistive material;
3 a second region and a third region formed from the middle layer of
4 resistive material; and,
5 fourth region and a fifth region formed from a top layer of conductive
6 material;
7 wherein the second region is located between the first region and the
8 second region;
9 wherein third region is located between the first region and the third
10 region; and,
11 wherein the first region has a higher resistivity than the second region
12 and than the third region.

1 11. A heating device as in claim 10 wherein:
2 the top layer comprises aluminum;
3 the middle layer comprises tantalum aluminum; and,
4 the bottom layer comprises WSi3N4.

1 12. A heating device as in claim 10 wherein the heating device is within a
2 total internal reflection switching element used in an optical cross-connection
3 switch.

1 13. A heating device as in claim 10 wherein the heating device is within
2 an inkjet printhead.

1 14. A heating device within an integrated circuit, comprising:
2 a first conductive lead;
3 a second conductive lead;
4 a third conductive lead;
5 a fourth conductive lead;
6 a first resistive region connected between the first conductive lead and the
7 third conductive lead; and,
8 a second resistive region connected between the second conductive lead
9 and the fourth conductive lead;
10 wherein a side formed by the first conductive lead, the first resistive
11 region and the third conductive lead is parallel to a side formed by the second
12 conductive lead, the second resistive region and the fourth conductive lead.

1 15. A heating device as in claim 14 wherein an insulator is placed
2 between the side formed by first conductive lead, the first resistive region and
3 the third conductive lead and the side formed by the second conductive lead, the
4 second resistive region and the fourth conductive lead.

1 16. A heating device as in claim 14:

- 2 wherein a third resistive region is placed between the first resistive
3 region and the second resistive region; and,
4 wherein resistivity of the third resistive region is higher than resistivity
5 of the first resistive region and of the second resistive region.
- 1 17. A heating device as in claim 14 wherein the heating device is within a
2 total internal reflection switching element used in an optical cross-connection
3 switch.
- 1 18. A heating device as in claim 14 wherein the heating device is within
2 an inkjet printhead.
- 1 19. A heating device as in claim 14 wherein the heating device is placed
2 on a structure that defines a bore hole exit for an inkjet printhead.
- 1 20. A heating device as in claim 14 wherein the heating device is
2 arranged as part of a tube design for an inkjet printhead.